DEC 21 1973

5/S

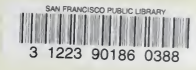
SAN FRANCISCO
PUBLIC LIBRARY

GOVERNMENT INFORMATION CENTER
SAN FRANCISCO PUBLIC LIBRARY

REFERENCE BOOK

Not to be taken from the Library

DOCUMENTS DEPARTMENT



Digitized by the Internet Archive
in 2016 with funding from
San Francisco Public Library

https://archive.org/details/reportonrehabili1195mill

1204

Report

ON THE

Rehabilitation

OF THE

SAN FRANCISCO MUNICIPAL RAILWAY

From 1947 to 1951

■

MARMION D. MILLS
Consultant

■

APRIL 1, 1951

REPORT
ON THE

REHABILITATION
OF THE
SAN FRANCISCO MUNICIPAL RAILWAY
FROM
1947 To 1951

MARMION D. MILLS
CONSULTANT
APRIL 1, 1951

1807

TABLE OF CONTENTS

		Page
	LETTER OF TRANSMITTAL	
I	MUNICIPAL RAILWAY AT END OF WORLD WAR II	1
	Consolidation of Muny & Market Street Railway	1
	Reasons Behind the Purchase	1
	What Was Accomplished by Consolidation	2
	Routes and Rolling Stock	3
	Shops and Garages	4
	War Time Operation	4
	Map of Routes Before Rehabilitation November 26, 1947	5
	Equipment Changes - 1944-1947	6
	Necessity for Rehabilitation	6
II	DEVELOPMENT OF THE 1947 REHABILITATION BOND FUND	7
	Rehabilitation Without Change in Method	7
	National Changes in Transit Method	7
	Conversion from Rail to Rubber Tires An Economic Necessity	8
	Map of Recommended Routes Proposed by Technical Committee	9
	Scope of Bond Issue	10
	Plan Defined a "Pattern" of Transit	10
	Development of Bond Issue	11
	Report of DeLeuw, Cather and Company March 5, 1948	11
	Bingham Emergency Plan	12
III	THE PLAN AS IT DEVELOPED	13
	Changes in the Original Plan	13
	Employment of Consultant	13
	Economic Considerations Involved in Conversion	14
	Changes in Motor Coach Routes	14
	Improved Street Car Operation	14
	Cable Car Improvement	15
	Remaining Trolley Coach Conversion	15
	Comparison of First and Final Plans	15
	Consolidation of Terminals	16
	What Has Been Accomplished	17
	Map of System After Conversion	18

*3-2.7
Sa529r

73 87

IV ORGANIZATION OF THE MUNICIPAL RAILWAY 19

Changes in Organization to Meet New Conditions 19
Public Criticism 19
Jenkins' Report 19
Reorganization of Management and Staff 20
Related Improvements 21
Effect Upon the Muny 21
Accident Chart 22
Cooperation With Police and Planning Commissions 23

V RESULTS OF OPERATION - 1946-1950 24

Operation During Conversion 24
Service Good in Comparison 24
Impact of the Automobile 25
Increased Traffic Congestion 25
Passenger Decline a National Trend 26
Increase in Operating Costs 26
Operating Expense 27
Effect of Conversion from Rails to Rubber 27
Statement of Revenue, Expense & Net Income, Mileage, Hours & Passengers Carried 28
Future Trends 29
Future Financial Position 29

VI LOGICAL STEPS TO COMPLETE MODERNIZATION 30

1947 Rehabilitation Program 30
Cable Railway Lines 30
Value of Cable Lines to San Francisco 31
Proposed Cable Net 32
Trolley Coach Replacement of Remaining Lines 33
Improvement in Street Traffic 33
Proposed Cable and Trolley Routes over Nob Hill 35
Cars Desirable on Tunnel Lines 36
Cost of Two-Man Operation 36
Rerouting of M Line 37
Trolley Coach Lines 39
Motor Coach Operation 42
New Motor Coach Program 43
Express or Limited Stop Service 43
Improved Motor Coach Coverage 44

VI LOGICAL STEPS TO COMPLETE MODERNIZATION, Cont'd

Additional Facilities 44
Cost of Proposed Rehabilitation 45
Geary Alternative 46
Other Alternatives 47
Map of Proposed System 48

VII CONCLUSIONS
Rehabilitation Accomplished 49
Operation 49
Organization 49
Program for Completion of Modernization 49
Increased Revenue Essential 49

VIII RECOMMENDATIONS 50

PLATES

I MAP OF MUNY SYSTEM - NOVEMBER 1947 5
II MAP OF PROPOSED SYSTEM - 1947 9
III MAP OF COMPLETED SYSTEM - 1951 18
PHOTOGRAPHS OF MODERNIZATION, FOLLOWING PAGE 18
IV GRAPH OF MILEAGE AND ACCIDENTS 22
V PROPOSED CABLE & TROLLEY ROUTES OVER NOB HILL 35
VI GRAPH OF RIDING ON K, L & M LINES 38
VII PROPOSED SERVICE IN SUNSET & MERCED DISTRICTS 41
VIII MAP OF PROPOSED SYSTEM 48

EXHIBITS

A-1 REVENUE AND EXPENSES - 1947
A-2 REVENUE AND EXPENSES - 1948
A-3 REVENUE AND EXPENSES - 1949
A-4 REVENUE AND EXPENSES - 1950

CITY AND COUNTY OF SAN FRANCISCO

PUBLIC UTILITIES COMMISSION

April 1, 1951

MUNICIPAL RAILWAY
2600 Geary Boulevard
Phone FIllmore 5656
Postal Zone 18

Subject: Rehabilitation of the
San Francisco Municipal Railway
1947 - 1951

The Honorable
The Public Utilities Commission
of San Francisco
San Francisco, California

Gentlemen:

It is the purpose of this Report to:-

1. Briefly describe the condition of the Municipal Railway at the end of World War II and to indicate the necessity of rehabilitating and modernizing the then obsolete plant.

2. Consider the decisions that were incorporated in the 1947 Rehabilitation Bond Fund, including the opinions of the several experts consulted.

3. Indicate the changes subsequently made to the original plan and the reasons therefor.

4. Describe the remaining steps to complete the rehabilitation as provided from the 1947 Bond Fund.

5. Indicate the changes in internal organization of the Municipal Railway that have been made to improve efficiency and service.

6. Outline the financial result of operation of the Municipal Railway from 1947 to date.

7. Indicate a logical program for completion of rehabilitation of the Municipal Railway.

Respectfully submitted,

Marmion D. Mills
Consultant

PART I
THE MUNICIPAL RAILWAY AT THE END OF WORLD WAR II

CONSOLIDATION OF THE MUNY AND THE MARKET STREET RAILWAY

On September 29, 1944 the Municipal Railway acquired the properties of the Market Street Railway for a price of $7,500,000 of which $2,000,000 was paid from available Municipal Railway funds, the balance to be paid from the earnings of the acquired properties - estimated to require less than three years. This purchase was approved by a vote of 108,621 electors against 84,078 opposing the acquisition. At this time the Nation was in the middle of World War II and, as San Francisco was the hub of the war effort in the Pacific, the demands for transit were heightened tremendously.

REASONS BEHIND THE PURCHASE

Due to inability of the Market Street Railway to provide adequate service, the war effort was being impeded. For two years the Municipal Railway, with one-third of the equipment and one-fourth of the track facilities, had been carrying 52% of the passenger load. While the Municipal Railway had available funds for purchase of additional equipment, authorization for such purchase could not be obtained from the Office of Defense Transportation until certain idle Market Street Railway equipment was put in service. Offers to lease some of this idle equipment by the Municipal Railway were turned down by the Market Street Railway management. At this point, Mayor Roger D. Lapham made a personal campaign to seek approval of the electorate at an election on May 16, 1944 stressing the following principle reasons:-

1. Pay $2,000,000 and secure the Market Street Railway's terminals, garages, shops, yards and usable equipment.

2. Take over the ancient cars and track which, while classed as "junk", were still usable during the War and would earn sufficient to pay the remaining balance of $5,500,000 of the purchase price.

3. Secure at once the advantages of one management, one wage scale, one fare and of a free, universal transfer privilege.

4. Take every possible step to speed up and improve service with the facilities at hand and begin at once to build for the future.

5. Eliminate the hazardous outside tracks on Market Street as quickly as possible.

6. Have the advantage of controlling the major transit facilities and of being in a position to provide for future needs through rehabilitation and modernization of the entire consolidated system at the end of the War without having to wait twelve years - the life of the Market Street franchise - to take over the Market Street "junk".

WHAT WAS ACCOMPLISHED BY THE CONSOLIDATION

Unification of the two systems which serve San Francisco was admittedly a long step forward. It brought about a single fare throughout the city, with universal transfer, a single management and a single wage scale. It failed to eliminate much of the duplication of service which had existed, this largely because the entire system was overloaded by the war effort and it was necessary to operate virtually all lines to the limit of capacity of the rolling stock. Merging the employees of the two properties created tensions which have resulted in the organization of two unions - one AFL and one CIO - thereby creating a major roadblock in establishment of harmonious employee relations. Absorption of management staffs also proved difficult and resulted in a somewhat top-heavy organization which had to be adjusted over the course of the past three years through retirements or consolidation of positions.

ROUTES AND ROLLING STOCK

The routes, mileage and rolling stock of the Municipal Railway and of Market Street Railway as of September 29, 1944 were as follows:-

Municipal Railway

Item	Elec Rail Lines	Cable Rail Lines	Trolley Coach Lines	Motor Coach Lines	Total System
Number Routes	10		1	10	21
Route Miles, O.W.	56.6		3.4	31.5	91.5
Total Vehicles	238		9	41	288

Market Street Railway

Number Routes	22	2	1	19	44
Route Miles, O.W.	119.2	3.9	5.1	852	213.4
Total Vehicles	440	38	9	124	611

Combined System

Number Routes	32	2	2	29	65
Route Miles, O.W.	175.8	3.9	8.5	116.7	304.9
Total Vehicles	678	38	18	165	899

MAP OF ROUTES

There is presented on Plate I on Page 5 a comprehensive map of the street car, cable car, trolley coach and motor coach routes, comprising the Municipal Railway system as of November 26, 1947.

CONDITION OF THE ROLLING STOCK

The condition of the rolling stock of the combined system was about as follows:-

Street Cars

Of the 678 cars, five P.C.C. type, purchased by Muny in 1939, were modern and in good condition, 233 remaining Muny cars were old (43 dating back to 1912) but of steel frame construction and in good condition, while the 440 cars acquired from Market Street - all of wood construction - were in poor condition, 79 being inoperable.

Cable Cars	The 38 cable cars, all built about 1890 were of wood construction and in poor condition. Eleven cars were inoperable.
Trolley Coaches	All eighteen trolley coaches were in good condition.
Motor Coaches	Generally speaking, the forty-one Muny buses were in good condition as were about the same number of Market Street buses. Forty Market Street buses were inoperable.

SHOPS AND GARAGES — At the date of consolidation, the Muny operated two car houses - Geary and Potrero - which were in good condition. The main shops and general offices were also located at Geary. The Muny did not own a bus garage but resorted to rented quarters and other makeshifts inadequate for the growing bus fleet. Market Street, at the time, possessed a bus garage at 24th and Utah, converted from a car house, six car houses and an outdoor storage yard and the General shops at San Jose and Ocean Avenues. All of this plant was old and, with exception of the 24th Street garage and the cable barn at Washington and Mason, all were in poor condition.

WAR TIME OPERATION — The immediate objective upon consolidation was to so operate the combined system as to not impede the war effort in San Francisco by anything resembling a transportation breakdown. Every effort was executed to keep the worn out system running, particularly in providing for movement of workers to shipyards, industrial plants and offices. Generally speaking, the Muny succeeded in this effort although the character of the service rendered was far below desirable standards.

PLATE I

LEGEND

- STREET CAR
- CABLE CAR
- TROLLEY COACH
- MOTOR COACH

SAN FRANCISCO MUNICIPAL RAILWAY
TRANSIT ROUTES
NOVEMBER 26, 1947

BEFORE REHABILITATION

EQUIPMENT CHANGES 1944 - 1947

During the period from September 29, 1944 to December 31, 1947 a total of 153 new vehicles were purchased and eighty-six disposed of as follows:-

	Elec Cars	Cable Cars	Trolley Coaches	Motor Coaches	Total Vehicles
On hand 9-29-44	678	38	18	165	899
Purchased			16	137	153
Total	678	38	34	302	1,052
Disposed of	(86)			(19)	(105)
On hand 12-31-47	592	38	34	283	947

NECESSITY FOR REHABILITATION

The necessity for rehabilitation of the combined Muny system, as soon as war condition would permit, was thoroughly appreciated by the city Administration. As early as October 1944, the Public Utilities Commission retained the services of Mr. L. V. Newton, former general manager of the Market Street Railway, to prepare a Post-war Transit Plan and this plan was prepared and submitted to the Commission on April 16, 1945. After much discussion, the Administrative Transportation Planning Council of San Francisco was formed to develop a coordinated transit plan. The council consisted of the Public Utilities Commission, the City Planning Commission, the Police Commission and the Chief Administrative Officer. The council appointed a technical committee consisting of:-

J. H. Turner (Chairman)	Manager of Utilities
H. C. Vensano	Director of Public Works
T. J. Kent, Jr.	Director of Planning
Michael Riordan	Deputy Chief of Police

which prepared and submitted a comprehensive plan for Traffic, Transit and Thoroughfare Improvement for San Francisco on March 1, 1947. Only that part of the report which has to do with transit will be discussed and referred to in this current Report.

MUNICIPAL RAILWAY AS OF MARCH 1947

As of the date of completion of the report of the Technical Committee, the Municipal Railway (see Plate I) consisted of 32 street car routes, 2 cable car routes, 2 trolley coach routes and 29 motor coach routes - a total of 65. This system was aptly described by the Technical Committee as "a heritage from the past when conditions which no longer prevail, determined its form." The Ferry Building through which fifty-five million persons passed annually before the construction of the Bay Bridge, had become a ghost through which two million annual passengers now moved. Obviously, the Ferry Building was no longer the major terminus for the transit routes which serve the city.

REHABILITATION WITHOUT CHANGE IN METHOD

Rehabilitation of the thirty-two street car routes would have required construction of more than 174.95 miles of single track at a cost of $23,908,000; of substations and feeders costing $2,000,000 and would have necessitated the purchase of 476 modern P.C.C. cars, costing $17,708,000 or a total of $43,616,000. To this must be added the cost of 259 new buses - $4,140,000 - required to rehabilitate the twenty-nine bus routes and $4,000,000 required for new car houses and shops or a grand total of $51,756,000. Obviously, such a capital outlay would have been prohibitive, particularly as it would have necessitated the use, under City Charter, of two-man crews on all street cars adding about $2,000,000 to the annual cost of operation. This would have been an economic absurdity.

NATIONAL CHANGES IN TRANSIT METHOD

Prior to 1918, mass transit in American cities was handled exclusively by electric or cable surface cars and by rapid transit either above or below ground. A few companies, such as a Fifth Avenue Coach Company of New York, rendered partial city service by motor bus upon individual routes but this was comparatively rare. Subsequent to 1918, however, transit companies began to purchase motor buses, first, for extension of existing lines and later in direct replacement of unprofitable rail lines. The first total replacement of a small city operation occurred in 1921.

Between 1922 and 1950 the change in surface transit methods in American cities is reflected in the following statistics as published by McGraw-Hill Company and General Electric Company:-

NUMBER OF AMERICAN CITIES (OVER 10,000)

Year	Served by Transit	Served by Street Cars Only	Served by Street Cars and Buses *	Served by Buses * Only
1922	775	560	197	18
1928	775	239	348	188
1932	848	113	435	300
1936	837	62	341	434
1940	857	32	250	575
1948	1,059	5	141	913
1950	1,075	5	128	942

* Including both motor coaches and trolley coaches.

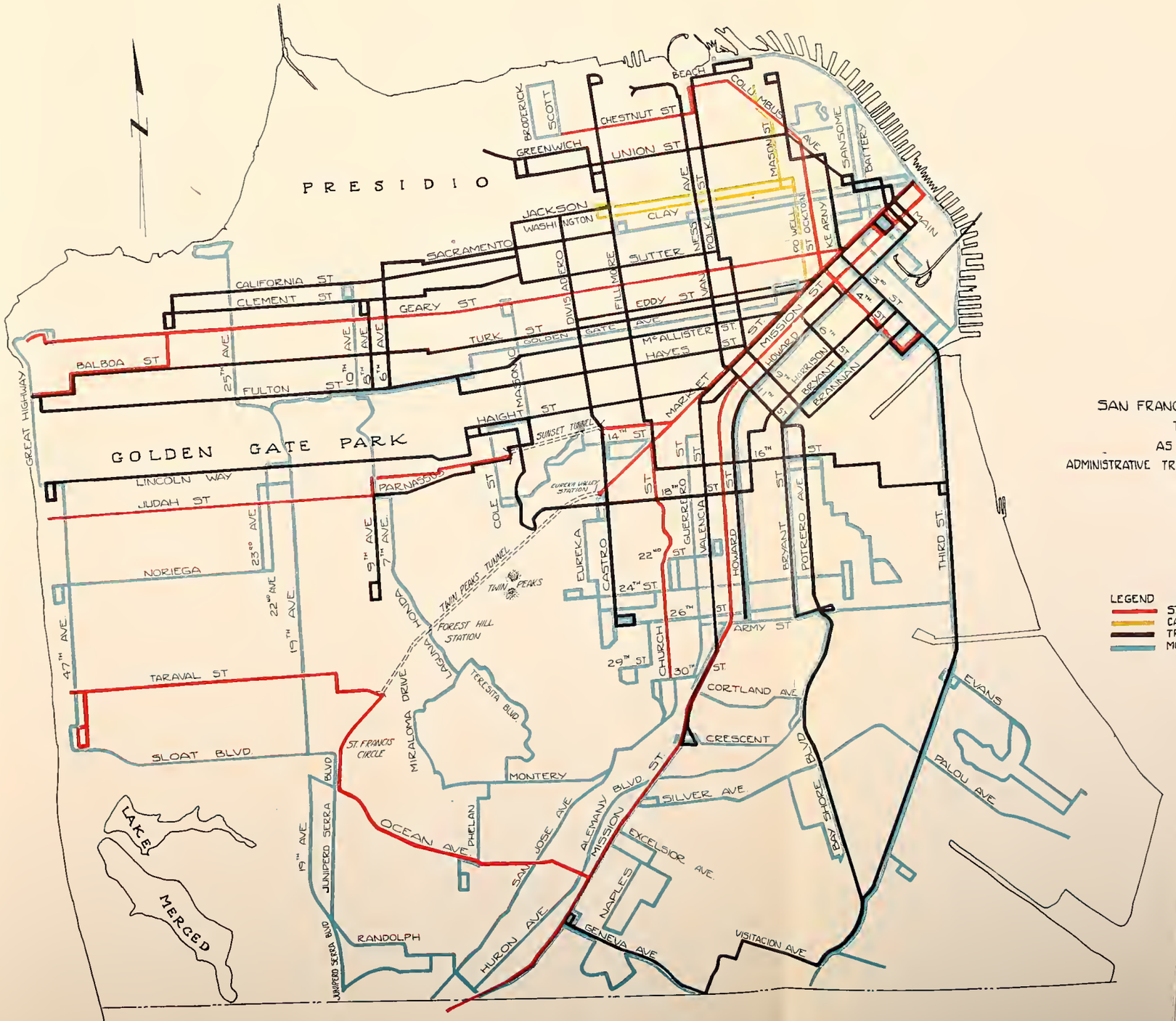
CHANGES DUE TO ECONOMIC NECESSITY

The rapid changes in surface transit in American cities from street cars to more mobile buses and trolley coaches, as outlined in the preceding paragraph, have been forced by economic necessity against the strenuous opposition of both many street railway executives and of responsible city heads as the growth in the use of the private automobile stripped from the street cars the passengers needed for profitable operation and materially added to the cost of such operation through increased paving costs and the cost of peak operation to move growing morning and afternoon rush hour loads.

CONVERSION FROM RAIL TO RUBBER TIRES AN ECONOMIC NECESSITY

The prohibitive cost of rebuilding the worn out street railway lines in San Francisco and the necessity of reducing operating expenses, particularly in face of a steady drop in passengers since V-J Day - which was more than apparent to the Technical Committee in early 1947 - made mandatory the conversion of all possible of the old rail lines to less expensive methods of transit. The report of the Technical Committee to the Planning Council in March 1947 clearly recognized this obligation and recommended a reduction from thirty-two street railway lines to nine and an increase in trolley coach lines from two to seventeen. The recommended routes as proposed by the Technical Committee are shown on Plate II on Page 9.

PLATE II



SAN FRANCISCO MUNICIPAL RAILWAY
TRANSIT ROUTES
AS RECOMENDED BY
ADMINISTRATIVE TRANSPORTATION PLANNING COUNCIL
MARCH 7, 1947

LEGEND
- STREET CAR
- CABLE CAR
- TROLLEY COACH
- MOTOR COACH

DL-4564

SCOPE OF BOND ISSUE

Recognizing clearly that the plan that was proposed was only the beginning of a complete rehabilitation, an initial bond issue was set up which was sufficient to accomplish the changes presently recommended, as follows:-

EQUIPMENT			
P.C.C. Type Street Cars	55	$1,705,000	
Trolley Coaches	361	7,220,000	
Motor Coaches	98	1,592,000	$10,517,000
WAY & STRUCTURES			
Track Reconstruction	26 Miles	3,365,000	
Trolley overhead	164 Miles	2,560,000	
Substations & Feeders		1,500,000	
Car Houses, garages & Shops		2,618,000	
Sub-total		10,043,000	
Less existing appropriations		900,000	9,143,000
REMOVAL OF ABANDONED PROPERTY			340,000
TOTAL BOND ISSUE			$20,000,000

PLAN DEFINED A "PATTERN" OF TRANSIT

The proposed plan established a "pattern" of transit without jeopardizing the development of long range plans involving rapid transit or subways. It reduced the number of lines operating radially from the Ferry Building and developed "downtown" terminals nearer the heart of the retail and financial districts and the Bridge Terminal. While recognizing that the nine proposed street railway lines would require a total of 282 street cars, it limited the purchase of new cars to fifty-five, conceding that the operation of 212 of the best of the old cars should be continued for the present in order that the bond money could be better used in replacing twenty-three remaining rail lines with trolley or motor coaches.

PLAN NOT RIGID

It was recognized by the Technical Committee that the plan must be subject to modification before it was executed in order to meet situations that might be expected to arise and that certain deviations from the basic plan would not materially affect either the estimate or the overall result. Furthermore, the Committee recognized that an extensive traffic survey covering the entire Bay Area was even then being conducted, the results of which might dictate changes in the plan.

DEVELOPMENT OF THE BOND ISSUE

The report of the Technical Committee was studied in detail by the Planning Council and was further submitted to and approved by a committee of private citizens composed of experts in the fields of transportation, construction, engineering and architecture. Pursuant to the findings of the Planning Council, the Board of Supervisors authorized submission of a bond issue to the voters, the ballot argument stating:-

> "This program proposes a fleet of modern vehicles composed of street cars, trolley coaches and motor coaches, the distribution and exact numbers of which will be determined by further expert study and the requirements indicated by the step by step experience had as the modernization program progresses."

REPORT OF DE LEUW, CATHER AND COMPANY MARCH 5, 1948

Because of desire for further expert study, both the citizens' committee and the Board of Supervisors made it clear in the ballot argument that the Technical Committee's recommendations were subject to change. The nationally known consulting firm of DeLeuw, Cather and Company of Chicago was engaged to make further recommendations, which they did, before the first bond funds became available. One of the biggest changes recommended and adopted was conversion of the Mission system from street cars to motor or trolley coaches, thus reducing the need for new street cars by thirty-five and increasing buses by seventy. The reason was obvious. Due to rapid postwar rises in costs, it would have taken more than a third of the entire bond issue to have reconstructed and equipped Mission Street for street car operation. The consultants further recognized that the street car system acquired in 1944 from the Market Street Company had become so undependable and unsafe that further delay in conversion could not be tolerated. Deliveries of either street cars or trolley coaches could not be obtained for at least eighteen months. Accordingly, the consultants recommended and the Public Utilities Commission approved the immediate purchase of 259 motor coaches, all of which are now in operation.

BINGHAM EMERGENCY PLAN

In the early part of 1948 the city of New York loaned Mayor Elmer E. Robinson the services of Colonel Sidney Bingham, Chairman of the Board of Transportation, New York City, for the purpose of investigating the Muny with a view of suggesting immediate remedies to provide necessary emergency transportation facilities. Colonel Bingham, in a report dated March 26, 1948, recommended continuation of eight street car lines, two of which (F and D) have subsequently been changed to trolley and motor coach, respectively, and of replacement of fifteen railway lines by motor coach operation. This plan would have required the purchase of 303 buses less 190 forty-four passenger buses that were already on order or 154 additional fifty passenger diesel-hydraulic buses of the type used in New York City. The pattern of conversion recommended by Colonel Bingham has, in general, been followed although nine of his recommended routes have been converted to trolley coach operation.

ADDITIONAL BENEFIT OF MOTOR COACH PURCHASES

It must be noted that in the conversion program, the city could not have made the speed of conversion with any fewer motor coaches than were purchased. These coaches served to satisfy partly the Bingham emergency plan but in particular, were available in the step by step conversion of system units from rail to trolley coach. As improvements were made, in approximately six months intervals, the motor coach fleet was moved from one part of the city to another and during the conversion there was never an excess of motor coaches.

CHANGES IN THE ORIGINAL PLAN

The major changes in the plan, as the work of rebuilding the Muny progressed, were primarily brought about in the interest of speeding up the conversion. It was clearly recognized, both by the Muny staff and by the several consultants, that a real transit emergency existed in 1948 which could best be solved by immediate replacement of the worst of the rail lines by motor coach and that this could be effected within four months as compared to periods of eighteen months required to erect trolley overhead. Accordingly, the original plan, as previously discussed, was altered and motor coaches were placed in service on the following lines, some of which had previously been considered for trolley coach operation.

No. 2 - Clement
15 - Third Street
19 - Polk
24 - Divisadero
25 - Bryant
31 - Balboa
45 - Van Ness
55 - Sacramento

Later changes in the plan resulted in the F - Stockton rail line being converted to trolley coach while the M - Ocean rail line has been allowed to remain instead of being converted to bus. The No. 14 - Mission line was changed from rail, as originally proposed, to motor coach and will be converted to trolley coach in September, 1951.

EMPLOYMENT OF CONSULTANT

Toward the end of 1949, the Public Utilities Commission decided upon employment of a full time Transit Consultant and Expediter to advise them on desired changes in the Rehabilitation Plan and in organization and operating procedures and to execute their decisions, once made. The writer was selected to fill this assignment and has done so since February 15, 1950. Such changes as have been made subsequent to that date have been based upon his recommendations.

ECONOMIC CONSIDERATIONS INVOLVED IN CONVERSION

The economic considerations involved in conversion of street railway operation to either trolley or motor coach have been very much in the minds of all those who have had anything to do with the job of planning for rehabilitation. Not only the high initial cost of reconstructing the old street car lines but the HIGH OPERATING COST of the street car - with two-man crews, as required by City Charter - in comparison with rubber tired operation has definitely pointed the necessity of conversion wherever possible. This has led to recommendations by this writer for conversion of both the Geary and Church Street car lines though these conversions had to be postponed, after development of the crisis in Korea, because of the shortage of qualified young men for trolley coach operators.

CHANGES IN MOTOR COACH ROUTES

A number of changes have been made in certain of the motor coach routes to bring about greater coverage in the area served. A notable instance is in the Sunset District where service over 46th Avenue, Sunset Boulevard, 30th Avenue and 16th Avenue (Sunset Heights) has been added. These new routes have received considerable acclaim from persons directly served. Further improvement in service to this and other districts is contemplated and will be discussed in Part VI of this Report.

IMPROVED STREET CAR OPERATION

It has been recognized by all qualified persons who have studied the San Francisco problem that the layout of Market Street and the physical obstacle presented by Twin Peaks made some form of rapid transit below the surface of Market Street and through the Twin Peaks and Sunset Tunnels desirable even though the passenger load is not great enough to make such a project economically self-supporting. It is to be regretted that plans being developed for the Planning Commission by Colonel Sidney H. Bingham of New York and by DeLeuw, Cather and Company of Chicago have had to be indefinitely postponed because of the national emergency that has developed since June, 1950. Inasmuch as it may be ten years before conditions may permit resumption of rapid transit plans and as patrons of the K, L and N lines cannot be expected to remain satisfied with operation of fifteen modern street cars out of a total of

forty-seven required for base operation and eighty-five for rush hour operation, the Public Utilities Commission has approved the purchase of twenty-five modern P.C.C. cars for service on these lines.

CABLE CAR IMPROVEMENT

While complete rehabilitation of the Muny cable car lines was not contemplated in the 1947 bond issue, the physical condition of these lines and the voters' action on November 4, 1947 of approving continued operation of these cable lines, has necessitated some expenditure for rebuilding part of the cable tracks and improving the equipment. One car has been completely rebuilt. In fact, it is now a new car - Model 1890 - under an old roof. The condition of this seventy year old equipment is such that "patching" or other partial repairs is not sufficient. Improvement in brakes and lighting to meet present day traffic conditions is being attempted. Sufficient funds have been appropriated to rebuild all worn out track on both the Powell-Taylor and Washington-Jackson cable lines.

REMAINING TROLLEY COACH CONVERSION

Construction of trolley coach overhead wire on the Van Ness - Potrero line is now under way and is due for completion in July. Plans for trolley overhead on the Mission line from Richland to Daly City and over Ocean Avenue from Mission to Phelan are in process of preparation and contracts will soon be let. Forty additional trolley coaches are now on order. Completion of the Mission and Potrero trolley lines will free some fifty-three motor coaches, thereby providing the means for improving service on existing motor coach lines and for limited stop or express service on both trolley and motor coach lines.

COMPARISON OF THE FIRST AND FINAL PLANS

When all improvement funds are expended and all equipment has been obtained, including the present scheduled conversion of the No. 47 - Potrero and No. 14 - Mission motor coach lines to trolley coach and the addition of twenty-five modern P.C.C. cars

to the K and L lines, the comparison between the first plan and the final plan will be as follows:-

	First Plan		Final Plan	
Street Cars	55	$ 1,705,000	35	$ 1,217,628
Trolley Coaches	361	7,220,000	364	7,034,123
Motor Coaches	98	1,592,000	259	4,219,057
Total Vehicles	514	$10,517,000	658	$12,470,808

The remainder of the available funds is being expended for overhead facilities, track reconstruction, for two modern trolley coach garages at Potrero and Presidio, for two modern motor coach garages at Ocean and Kirkland and other necessary operating features. Thus, despite materially increased costs for all rolling stock and materials, the fleet of modern vehicles greatly exceeds the original plan without essentially disturbing the pattern fixed by the Planning Council and voted on by the people in November, 1947 other than the fundamental change from street cars to trackless trolleys on Mission Street and on Stockton Street.

CONSOLIDATION OF TERMINALS

In 1946 the operations of the Muny were conducted from nine car houses and a rented garage. Some of these car houses were relics of the horse car age and were in a condition beyond repair. The Elkton Shops, while adequate in size, needed rebuilding and the operating staff, in the absence of sufficient central office space, were scattered throughout the city. In 1951, the management and staff is housed at the Geary-Presidio Terminal in a combination of old and new quarters. Two street car houses are maintained, one of which, Geary, is in excellent condition and the other at Geneva must be rebuilt. Trolley coaches are housed in two modern and efficient terminals at Presidio and Potrero. Motor buses are garaged in two new terminals at Kirkland and Ocean with the automotive repair shop at Utah. The cable operations are conducted from the Mason terminal which is in good shape. When the rehabilitation is completed, all Muny activities will be housed in six establishments.

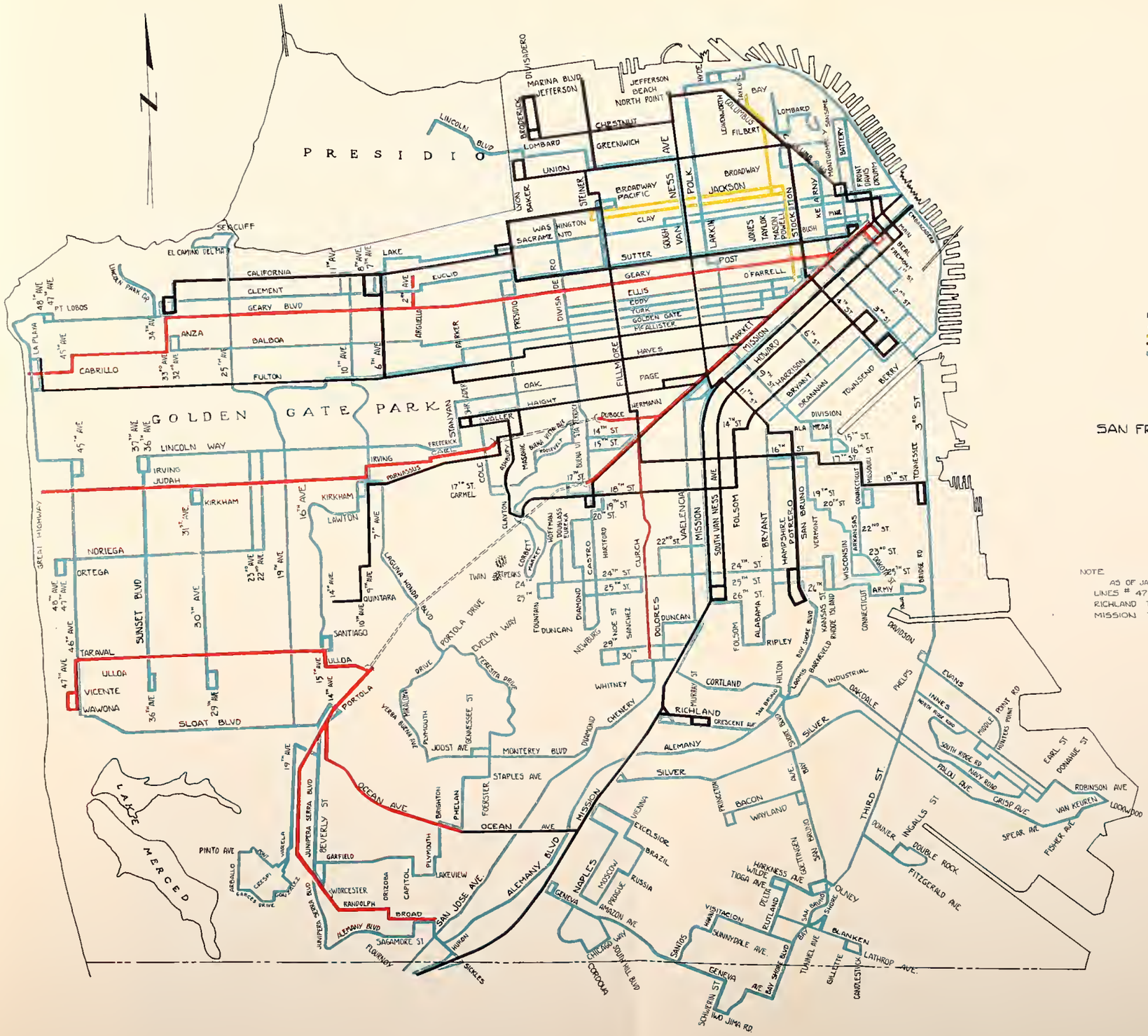
WHAT HAS BEEN ACCOMPLISHED

On the following page is presented a map of the Municipal Railway System (Plate III) as it is expected to look after conversion of the Mission and Potrero trolley coach lines now in process of completion. By comparison with the system in November, 1947, as shown in Plate I, Page 5, some idea may be obtained of the improvement in service that has been developed. Comparison of rolling stock is as follows:-

	Elec Cars	Cable Cars	Trolley Coaches	Motor Coaches	Total Vehicles
On hand 9-29-44	678	38	18	165	899
Purchased 9-29-44 to 12-31-47	-	-	16	137	153
TOTAL	678	38	34	302	1,052
Disposed of	(86)	-	-	(19)	(105)
On hand 12-31-47	592*	38	34	283	947
Purchased from Bond Fund	25**	-	340	259	624
Purchased from other than Bond Fund monies	10**	-	24	-	34
TOTAL	627	38	398	542	1,605
Disposed of	(417)	(11)	-	(49)	(477)
On hand 12-31-51	210	27	398	493	1,128

Notes: * Includes five modern cars
** All modern cars

PLATE IIIII



SAN FRANCISCO MUNICIPAL RAILWAY
TRANSIT ROUTES
AS PROPOSED FOR
SEPTEMBER 1951

NOTE
AS OF JANUARY 21, 1951 ONLY THE TROLLEY COACH LINES # 47 (VAN NESS - POTRERO), # 14 (MISSION FROM RICHLAND TO DALY CITY) AND # 12 (OCEAN FROM MISSION TO PHELAN) REMAIN TO BE COMPLETED.

DL-4565 (SEJ HM)

W
A

l
c
w
P
s
s

MARKET STREET
at 5:00 PM
BEFORE AND AFTER CONVERSION

MODERN TROLLEY COACHES ON MARKET STREET

NEW CAR UNDER AN OLD BELL
A 1951 VERSION OF AN 1890 MODEL

PRESIDIO COACH YARD AT NIGHT

POTRERO COACH YARD

KIRKLAND MOTOR COACH YARD

OCEAN MOTOR COACH YARD
ELKTON GENERAL REPAIR SHOPS IN BACKGROUND

ONE OF SEVEN ROTARY WASHERS
WHICH MAINTAIN A CLEAN COACH FLEET

PART IV
ORGANIZATION OF THE MUNICIPAL RAILWAY

CHANGES IN ORGANIZATION TO MEET NEW CONDITIONS

The complete rehabilitation of an old street railway property of the size of the San Francisco Municipal Railway involves much more than the construction of new shops and garages and replacement of some five hundred and three old street cars by more modern trolley and motor coaches. It also involves a reorientation of thinking upon the part of management, of retraining of operating and maintenance personnel in the handling of new equipment and of streamlining the operating organization for more efficient direction and utilization of this new equipment to better serve the public. Such a reorganization - particularly of a municipally owned property - is immensely more difficult and involved than the planning for and installation of the new facilities and rolling stock. In the case presented in San Francisco, this reorganization faced the further complexities introduced by the merger in 1944 of the former Market Street Railway Company with the old Muny. The sore spots developed under the merger carried forward into the later rehabilitation making the task doubly difficult.

PUBLIC CRITICISM

Under the circumstances, it was difficult for the public, during the conversion period, to understand such apparent failures in operation as discourtesy upon the part of a minority of car and coach operators - of schedule failures resulting in insufficient service at the proper time - of bunching of vehicles upon a route - of inability to get proper information - these and many other apparent evidences of difficulties within the Municipal Railway organization. As a result of the very considerable public criticism which developed and which not only reached the Public Utilities Commission but the City Administration as well, an investigation of the Municipal Railway was initiated by the Board of Supervisors in November, 1948 through employment of Arthur C. Jenkins, Consulting Engineer of San Francisco.

JENKINS' REPORT

Under date of April 30, 1949 Mr. Jenkins submitted a most comprehensive report of 202 pages of text accompanied by many exhibits covering his findings. His recommendations covered the whole field from that of city policy involving a proposed reorganization of the Public Utilities Commission, through the field of proper organi-

zation of the management and staff, down to improvement in operational practices covering procurement and training of personnel, safety and claims handling, control and direction of operation, improved techniques of maintenance of equipment and track and many other related matters.

CORRECTIVE ACTION TAKEN

Many of the faults found by Mr. Jenkins were already under correction by the Muny staff and subsequent to the employment of the writer as consultant and expediter by the Public Utilities Commission in February of 1950, many more of these faults recorded by Mr. Jenkins had been examined and corrective action taken where required, including such matters as the proper investigation of complaints, the initiation of a new and better transfer system, improved procedure covering accident reporting, classification and establishing responsibility and many other related matters. Some of the most pertinent recommendations made by Mr. Jenkins had to do with the desirability of reorganizing the management and staff, though his recommendations could not have been carried out without a Charter amendment.

REORGANIZATION OF MANAGEMENT AND STAFF

The writer fully recognized the necessity for reorganization of management and staff but has attempted to bring about such reorganization as was possible within the framework of existing laws governing the Municipal Railway. After lengthy study, including an analysis of the capabilities of the Municipal Railway staff and in complete agreement with the Manager of Utilities and the General Manager of the Municipal Railway, a reorganization of the Municipal Railway staff was announced on January 15, 1951. This plan of organization complies with the general practice followed throughout the transit industry on properties of like size, both privately and municipally operated. It conforms to the general controls exercised by the city as required by City Charter. It provides a framework for efficient operation of the Muny. It divides the activities and functions of the staff into two distinct groups - the first being the operating group consisting of Transportation, Equipment Maintenance and Track and Overhead Maintenance Departments functioning under direction of an Operating Manager and the staff group covering the functions of personnel, safety, claims, engineering, schedules, public relations, auditing and

procurement - the heads of which report, as does the Operating Manager, to the General Manager. Thus all the divisions of the Municipal Railway are now directly under the General Manager who is responsible to the Public Utilities Commission through the Manager of Utilities, for the operation, subject, of course, to the controls exercised under City Charter by the City Controller, the Board of Supervisors and the Civil Service Commission.

RELATED IMPROVEMENTS

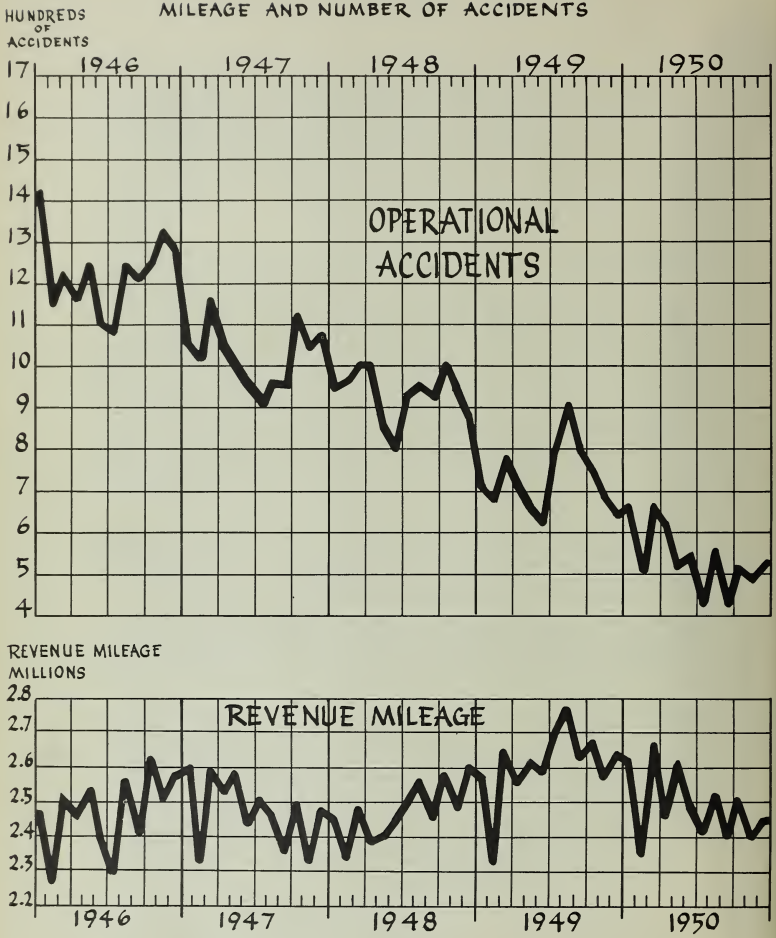
Noticeable improvement has been made in operation of the Municipal Railway during the past year. Personnel problems, which had reached a boiling point in early 1950, are now being solved as they arise through intelligent effort to seek solution based upon the equities of all concerned. More recent problems brought about by the current war manpower shortage are being worked out through cooperation with the Civil Service Commission. The splendid safety program which was inaugurated in 1949 has been continued as attested by a remarkable drop in the number of accidents, even though mileage continues to hold up to that operated in prior years. This is shown clearly in Plate IV on Page 22 of this Report. A new Superintendent of Traffic, appointed after nation wide examination, has assumed direction of the Schedule Division and noticeable improvement in developing efficient schedules has followed. Public relations are being improved through intelligent investigation of complaints and through telling the story of what has been done. Further improvements are in the making covering the field of information to the public. The entire Management staff has been consolidated and is now housed in a single building and holds regular meetings to bring about greater coordination and cooperation.

EFFECT UPON THE MUNY

The effect of these and many other related changes and improvements in staff functioning and control is beginning to be felt throughout the Municipal Railway. A noticeable improvement in courtesy is apparent. The supervision on the streets is much better than formerly with better direction through Central Control to eight radio-equipped supervisors in cars and to twenty-eight supervisors at fixed points with telephone connections. Better team play is evident.

PLATE X II

MONTHLY
MILEAGE AND NUMBER OF ACCIDENTS



MUCH REMAINS TO BE DONE

The writer recognizes clearly that what has been done to improve the operation of the Muny has been substantial but much remains to be done. Schedule difficulties cannot be corrected overnight. The necessary traffic checks required to develop sufficient service require time as does the further working out of new schedules and the time required for "bidding" on new runs by operating personnel. The effect of new "key" appointments of well qualified operating heads upon the rank and file of the organization requires time for sound leadership to obtain the requisite cooperation from the operating force. An improved passenger information service will shortly be installed, and the establishment of a downtown office where the public can conveniently seek lost articles and obtain proper information is now in process of development.

COOPERATION WITH POLICE AND PLANNING COMMISSIONS

More and more, it is becoming apparent that the entire city is directly concerned with the daily movement of people in and around all sections of the city in pursuit of business and recreation rather than in the movement of automobiles, street cars or buses. Intelligent utilization of the street net to bring about efficient movement is a matter of common concern of City Planning, Police, Public Works and Municipal Railway. Cooperation between the Muny and these other City Departments, while good, must be improved. The recent cooperative effort between the Chamber of Commerce and Traffic Division of the Police Department and the Muny to improve the traffic flow on Sutter Street indicated what could be done to better existing conditions. The present cooperative effort on the part of the Down Town Association to bring about voluntary staggering of working hours by business firms to make possible a more even flow of people into and out of the business district is a realistic approach to this problem of movement. Such cooperative effort should be city wide and continuing.

PART V
RESULTS OF OPERATION
1946 - 1950

OPERATION DURING CONVERSION

The preceding parts of this Report have dealt primarily with the problems of rehabilitation of a worn out street railway plant and of conversion from rails to rubber tires. During this period of conversion there has been no cessation in the daily job of transporting a considerable part of the population of the city. Operation could not be halted during the period of reconstruction. The various changes that have been carried out have resulted in considerable dislocation of previous travel habits. Once conversion has been completed upon an individual route, complaints and resistance have tended to decrease. A tremendous job of modernization has been done here in San Francisco that will become better appreciated with each passing year.

SERVICE GOOD IN COMPARISON

By comparison with transit service in other large cities - Chicago, Los Angeles, St. Louis, Seattle, Oakland, or where have you - the San Francisco Municipal Railway compares favorably in the service rendered to its patrons with any large transit property in the United States. This opinion will be corroborated by any qualified and unbiased transit engineer or by any fair minded user of transit who rides the service offered on other comparable systems.

THE AGE OF THE AUTOMOBILE

The five year period since the end of World War II has seen the greatest increase in the use of the private automobile in our history. Concurrently we have witnessed a tremendous surge of people from San Francisco to the suburban areas down the Peninsula and across in Marin County. The construction of huge housing developments west of Twin Peaks and in other perimeter areas and the building of vast commercial districts to service these residential areas is changing the business pattern. All of this has resulted in more and more use of private cars with a corresponding reduction in the use of mass transit.

THE IMPACT OF THE AUTOMOBILE

The following comparison between revenue passengers carried by the Muny and the increase in the use of automobiles in San Francisco is presented:-

	MUNICIPAL RAILWAY		SAN FRANCISCO COUNTY	
	Revenue Passengers	% Decrease	Paid Auto Registration	% Increase
1945	252,185,000		187,864	
		7.76		8.63
1946	232,610,700		204,089	
		4.81		11.04
1947	221,416,500		226,630	
		4.09		2.56
1948	212,339,000		232,443	
		7.72		12.06
1949	195,932,800		260,470	
		6.39		7.38
1950	183,419,700		279,706	
	Decrease	27.27%	Increase	48.88%

INCREASED TRAFFIC CONGESTION

As a result of this tremendous increase in the use of the private automobile, traffic in the business district is becoming more and more congested as parked automobiles not only take over all available curb space but overflow into restricted zones and bring about an excessive amount of double parking on the part of trucks which are denied the opportunity to get to the curb. This results in all traffic, including transit vehicles, moving at a steadily reduced rate of speed. From recent checks on Sutter Street, it appears that about 45% of people moving in and out of the business district ride in transit vehicles which require about 5% of the street space. Another 45% of people ride in private cars which take up approximately 85% of the street space. The remaining 10% of people are pedestrians, including commuters from the Bridge Terminal, and the remaining 10% of street space is required by trucks and interurban buses.

PASSENGER DECLINE A NATIONAL TREND

The decline in passenger riding discussed herein is not peculiar to San Francisco. It is national in scope as more people everywhere choose private transportation to meet their daily travel needs, regardless of relative expense. The freedom of action and comfort of the automobile outweigh the factors of cost of ownership and operation. But from a transit viewpoint each new automobile put in service in San Francisco takes away more than 700 annual rides on the Municipal Railway and, as stated before, does so at the expense of efficient movement on the city streets. Each year the continuing loss of passengers to private automobile drains away needed transit revenue entailing either a higher fare or a reduction of service as a means of keeping expense in balance with costs.

INCREASE IN OPERATING COSTS

Concurrent with the steady loss in transit riding to the automobiles since 1945 has come a material increase in expenses of every kind. Wages of operators have increased from 94 cents per hour in June, 1946 to $1.53 in July of 1950 - an increase of 62.8%. Further increases due to addition of a third week of vacation and liberalization of sick leave allowance as provided by law for all city employees materially add to payroll expense. Wages of shop and garage personnel have likewise jumped about 60% to July, 1950.

COST OF MATERIAL AND SUPPLIES

The rise in general costs since the end of the war are so well known as to need little discussion, but the following statement of increases in certain of the more important items of transit expense is of interest in showing the growing expense of transit.

Automotive Parts		Car & Trolley Parts	
Motor Coach Parts	48.7%	Car wheels, steel	82.0%
Gasoline	68.4	Brake shoes	100.0
Diesel fuel	88.0	Coils, Armature	62.0
Tire mileage	19.8	Bonds, copper	58.3
Piston gaskets	44.1	Cable, steel	48.2
Spark plugs	17.2	Trolley wire	47.7

OPERATING EXPENSE

All of this increase in labor and material since 1947 is, of course, reflected in the cost of operating each mile of service furnished to the public whether by street car, cable car, trolley coach or motor coach. The relative costs of each type of service for the years 1947 to 1950 inclusive, are shown clearly in Exhibits A-1 to A-4 which supplement this Report and from these figures it will be noted that the cost of operating street cars has increased from 77 cents to 93 cents per mile (exclusive of depreciation), that the cost of cable cars has risen from 1.38 cents to 1.83 cents per mile, that the cost of trolley coach has risent from 40.8 cents per mile to 52.9 cents, and that the cost of motor coach has risen from 42.6 cents to 50 cents per mile.

THE EFFECT OF CONVERSION FROM RAILS TO RUBBER

The great economical value to the Municipal Railway system of the large scale conversion from street cars to trolley and motor coaches has been that the conversion has more than offset the increased expense of each type, as shown in the consolidated figures for the entire system for the years 1947 to 1950 inclusive, which appear on the following page. System operating expense has decreased from 63.70 cents per mile in 1947 to 59.92 cents in 1950. This is primarily due to reduction in street car operation from 16,956,064 miles in 1947 to 5,250,665 miles in 1950 or 69.0% and to consolidation into fewer car barns and garages with resultant increase in efficiency. This is the outstanding development brought about by conversion. Interest charges and provision for depreciation (not funded) have increased from $1,190,087 in 1947 to $2,057,688 in 1950. This naturally reflects the acquisition of 658 new vehicles and of improved facilities.

OPERATING REVENUE

The decline in riding shown during the years 1947 to 1950 has been explained as part of a nation wide decline in transit riding. This decline bears no relation to the service furnished, inasmuch as the mileage operated in 1950 is 0.64% greater than in 1947 while revenue passengers have dropped more than 17.1% in the same period. This drop in riding has been offset somewhat by the fare increase in 1949 so that revenue in 1950 is only 3.1% lower than in 1947.

1950	
119,710	
921,213	
	6.1
	Cents Per Mile
145,683	60.65
12,695	.04
158,378	60.69
571,251	2.24
644,872	6.50
920,723	6.75
117,838	31.48
522,956	8.43
4,196	.02
347,473	4.50
929,309	59.92
229,069	.77
771,924	5.92
285,760	.96
057,684	6.88
328,615)	(6.11)
535,208	
	9.0
899,000	

FOLDOUT

FUTURE TRENDS

Riding on the Municipal Railway during the first quarter of 1951 appears to be down by less than 5% in comparison to the same period of 1950. This directly affects revenue in the same percentage. Conversion of the former Stockton street car to trolley coach on January 21, 1951 is the only change from rail to rubber tired operation scheduled until September when trolley coach operation will be extended from Richland Avenue over Mission Street to Daly City and over Ocean Avenue to Phelan Avenue, replacing part of the present Ingleside car line. Street car mileage should decrease about 1,380,000 miles during 1951 or about 26%. This will be the last major rail conversion under the 1947 Bond Issue. Operating costs are still rising with labor rates pointing toward a general 10% increase during the year and with Social Security now imposed upon the Muny to add about $160,000 to expense.

FUTURE FINANCIAL POSITION

In event that no further conversion is attempted and that reduction of expense can only be brought about through operating economies, such improvements in efficiency, while necessary, are not sufficient in themselves to provide the funds required to give the amount of service to the public which the Administration desires. Improved service is not possible on a starved revenue; therefore, the Public Utilities Commission and the Administration must determine on a policy of increased revenue to the Muny which must be provided either through added tax support or higher fares, or a combination of both. It is the opinion of the writer that fares should be adjusted upward so that the riders of public transit should pay the operating cost of the service while capital costs, including the depreciation required to maintain modern equipment, might well be the responsibility of the city. But first, all unnecessary costs should be eliminated, the largest single item of which is the unnecessary expense of two employees upon each remaining street car which will total $835,000 in 1951. This is "featherbedding", pure and simple, and should not be further tolerated either in the interests of the national manpower shortage brought about by the National Emergency or as a justifiable expense of operation.

1947 REHABILITATION PROGRAM

The rehabilitation program which has been carried out over the past three and a half years has gone a long way towards the modernization of the Muny. However, considerable remains to be done, if service on all lines is to be brought to a uniform standard. Both in the interest of better service to move people and for greater economy in operation, certain changes appear desirable to complete the program. These are discussed in the following pages.

CABLE RAILWAY LINES

Completion of the program of modernizing the transit plant in San Francisco should include a realistic appraisal of the place of cable cars in the transit picture - both the lines operated by the Muny and those operated by the California Street Cable Railway Company - and a decision to reconstruct such of those lines as it is to the public interest to maintain SAFE and ECONOMICAL operation. Continuance of operation of the three lines owned by CAL CABLE, surrounded as they are by parallel lines of the MUNY, is unsound and leads to wasteful duplication. Without entering into an argument as to how much the California Street Cable Railway lines are worth as a going concern, it is submitted that their continued operation prevents the development of an economical and adequate transit pattern in their area and that the acquisition of this company for a nominal value is justified and should be carried out.

THE CABLE PATTERN

Considering the cable lines of the MUNY and CAL CABLE as a single system, the physical plan consists of two cable barns and power houses, one at Washington and Mason, the other at Hyde and California. The lines consist of:-

1. Powell-Taylor — Powell and Market to Bay and Taylor. An operation of single-end cars with a turntable at either end of the line.

2. Powell-Jackson	Powell and Market to Jackson, to loop at Steiner to Washington, returning over Washington to Powell, thence to beginning at Powell and Market. Single-end cars.

The above lines operate as a unit, the cars being interchangeable, from the Washington-Mason cable barn.

3. California Street	California and Market via California to Presidio Avenue. An operation of double-end cars with crossover switches at either terminal.
4. Jones-Hyde-O'Farrell	From terminal at O'Farrell and Grant via O'Farrell, Jones, Pine and Hyde Streets to terminal at North Point. An operation of double-end cars with crossover switches at either terminal.
5. Jones Shuttle	A shuttle cable car from Market and Jones to O'Farrell and Jones. Double-end car with crossover switches at either terminal.

The above lines operate as two units from the Hyde and California barn. The grips are not interchangeable and the cars which operate on California cannot be used on the Jones-Hyde-O'Farrell lines.

THE VALUE OF THE CABLE LINES TO SAN FRANCISCO

The cable cars of San Francisco have two distinct holds upon the affections of the city. The first is the purely sentimental value attached by the old timers residing on Nob and Russian Hills to these picturesque chariots wending their way over the hills and through narrow streets, bringing back memories of "Old San Francisco", and the second is the undoubted tourist attraction of certain of these lines to the visitors who bring so much business to San Francisco. Cable cars, once in general use in many

cities, where steep grades had to be negotiated, are now extinct - except in San Francisco - and the rush of visitors to these old cars enroute to the hotels on Nob Hill or to Fisherman's Wharf is proof conclusive of their value as a tourist attraction.

COST OF OPERATION

Cable cars passed into oblivion because of their high cost of operation in comparison with more modern methods of transit. The remaining lines in San Francisco, while earning the highest revenue per mile of any of the city lines, are in the red because of exceptionally high expenses. Modernization of the seventy year old plants will reduce these expenses somewhat and further reduction can be obtained through consolidation and operation from one power barn, but the most optimistic estimates of any qualified transportation engineer will not predict income in excess of expenses from standard fares.

TOURIST LINES

The Powell-Taylor line operating from the turntable at Powell and Eddy passing Union Square and Nob Hill and terminating at the turntable at Bay and Taylor - two blocks from Fisherman's Wharf - is a primary tourist attraction. The operation of the turntable intrigues the interest of scores of tourists who even help turn the cars around. The California Street line west from Market Street through Chinatown and over Nob Hill and north on Hyde Street over Russian Hill to the vicinity of Aquatic Park is also a primary source of tourist interest.

PROPOSED CABLE NET

The following system of cable lines operated as a unit from the Washington-Mason power barn, will adequately serve the needs of residents on Nob and Russian Hills and will meet the necessary desires of tourists in traveling from one to the other of the various tourist meccas in the area served:-

1. Powell-Taylor	Service over existing route
2. Powell-Jackson	Service over existing route
3. California-Hyde	From terminal at California and Market via California to Hyde and via Hyde to North Point. Double-end cars to be used.

CONNECTION BETWEEN POWELL AND CALIFORNIA LINES

The necessary physical connection between the Washington-Mason car house and the proposed California-Hyde line should be on Hyde Street at Washington (eastbound) and on Jackson Street (westbound) to and from the car house. This will necessitate continuation of the Powell-Washington-Jackson line beyond Hyde Street and, if the line is to be operated this far, it would be better to continue service to the present terminal at Steiner. Construction of a conduit on Mason between Washington and California will enable the California-Hyde cable to be operated from Washington-Mason power house, utilizing the old "winders" formerly used to operate the Sacramento-Clay Street line. The problem of standardizing the cable grips on all cars is possible without too great cost.

THE TROLLEY COACH REPLACEMENT OF REMAINING LINES

California Street from Hyde Street to Presidio Avenue and Leavenworth Street from California to Sutter and Geary both lend themselves to trolley coach operation and a substitute trolley coach service over these routes is, therefore, recommended, as shown in conjunction with the proposed cable lines in Plate V on Page 35, and as discussed, together with other recommended trolley coach service, on Page 39 of this Report.

PRESENT LEAVENWORTH BUS LINE

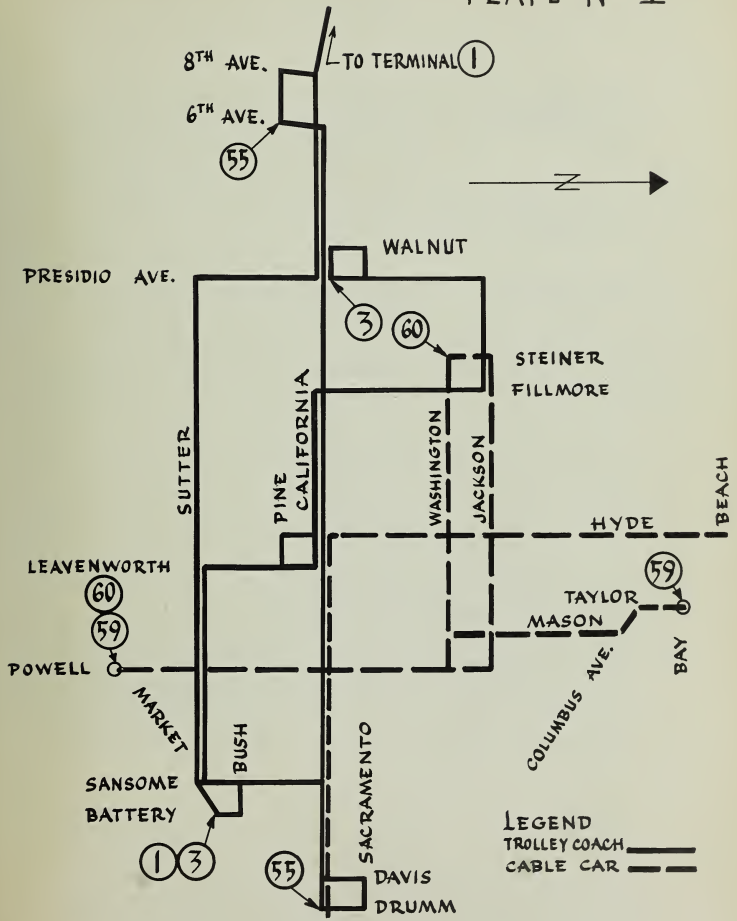
The apparent satisfaction of patrons with the new No. 80 - Leavenworth motor coach line would indicate that as an alternative plan to that shown on Plate V, the north end of the proposed Hyde Street cable could be established at Jackson Street and the present Leavenworth motor coach line could be continued over the present route.

IMPROVEMENT IN STREET TRAFFIC

At the present time the operation of the Jones-Hyde-O'Farrell cable in both directions on Pine Street is seriously interfering with the primary use of this street as a one-way artery. Elimination of the present Jones cable line will remove this road block on a one-way street and similar abandonment on O'Farrell will materially improve the general traffic pattern in the retail district. The Jones Street shuttle can be replaced by a rerouting of an existing bus line, if required.

SOUND IN PRINCIPLE — Such a pattern of proposed cable and trolley coach lines will materially improve the joint operations through the district served through elimination of all duplicated service. At the same time, it will give full accessibility between this district and the financial district to the east and the retail district to the south.

PLATE Nº V



PROPOSED CABLE & TROLLEY ROUTES OVER NOB HILL

NECESSARY RECONSTRUCTION OF PHYSICAL PLANT

The Washington-Mason power barn should be rehabilitated and made into a tourist attraction of itself. The tracks and cars on the three proposed cable lines should be rebuilt and made safe for operation under present day conditions without altering the form or appearance of the cars. Maintain this tourist attraction but do so SAFELY and EFFICIENTLY.

CARS DESIRABLE ON TUNNEL LINES

The problem presented in serving the population west of Twin Peaks can best be solved through continued use of the Twin Peaks Tunnel and the Sunset Tunnel, which were designed for street cars and are not sufficiently wide to encourage the operation of rubber tired equipment. The problem of service on Market Street also necessitates the continuance of operation in the center of the street as well as along the curb. Five trolley coach lines now operate along the curb on Market Street and the amount of service required on these lines in the rush hours has almost used the capacity of the curbs so that not more than one additional rail line now on Market Street can be transferred to trolley coach curb loading. Therefore, if the K, L, M and N lines must continue to operate in the center of Market Street, it is submitted that large capacity street cars will be more efficient than any other type of vehicle. Eventually, some form of rapid transit will be developed under Market Street to the Twin Peaks Tunnel either entailing the use of modern street cars underground in the Market Street area or of complete subway trains. In any event, therefore, it seems to be to the best interest of the city to continue the present K, L, M and N car lines adding sufficient additional P.C.C. cars to fill all the base requirements and rebuilding the best of the old cars for rush hour service. All of this should be conditional upon repeal of the present Charter provision requiring two-man crews.

COST OF TWO-MAN OPERATION

The high cost of operating street cars in comparison with rubber tired transit is doubly apparent in San Francisco because of the Charter provision requiring two men on every car. Modern P.C.C. cars, designed for and operated by a single operator, move the heaviest loads in Baltimore, Brooklyn, Boston, Washington, Chicago, Los Angeles, Philadelphia and Pittsburgh thus proving that the two-man operation

required in San Francisco is the sheerest form of "featherbedding". The following figures show the revenue and operating expenses of the tunnel lines in San Francisco for 1950 and the amount that could have been saved through one man operation:-

Line	Revenue	Operating Expense *	Net Loss	Cost of Conductor **	Net Loss Less Conductor
K Ingleside	$581,920	919,131	337,211	189,733	147,478
L Taraval	700,032	1,058,508	358,476	224,072	134,404
M Ocean	175,380	319,506	144,126	67,573	76,553
N Judah	823,195	1,081,963	258,768	230,811	27,957
TOTAL	2,280,527	3,379,108	1,098,581	712,189	386,392

*Includes depreciation, interest charges, abandonments and extensions.

**Includes proportionate share of vacations, sick leave, retirements, etc.

THE REROUTING OF M LINE

The present L - Taraval line and the K - Ingleside line (after it is shortened to Phelan and Ocean Avenues) are heavy revenue lines. This is not true of the M line which duplicates the service of the K line to St. Francis Circle and then operates a comparative thinly patronized service along 19th Avenue, Worcester, Randolph and Broad Streets. The comparative riding on these three lines is shown graphically on Plate VI on Page 38. Patronage on the M line along 19th Avenue should be materially improved by complete occupancy of the Stonestown and Parkmerced developments which are now being rapidly filled up. Because of the great massing of population in the Parkmerced area, it is submitted that the M line should be discontinued beyond 19th Avenue and should be extended through the center of Crespi Drive to circle the Parkmerced common. This would not be an expensive installation as most of the track required would be open track. A loop at Parkmerced common would place the terminal in the center of and within easy walking distance of more than 12,000 people who will be housed in this $60,000,000 development by the end of 1951. The present rail service over Broad and Randolph Streets should be replaced by a

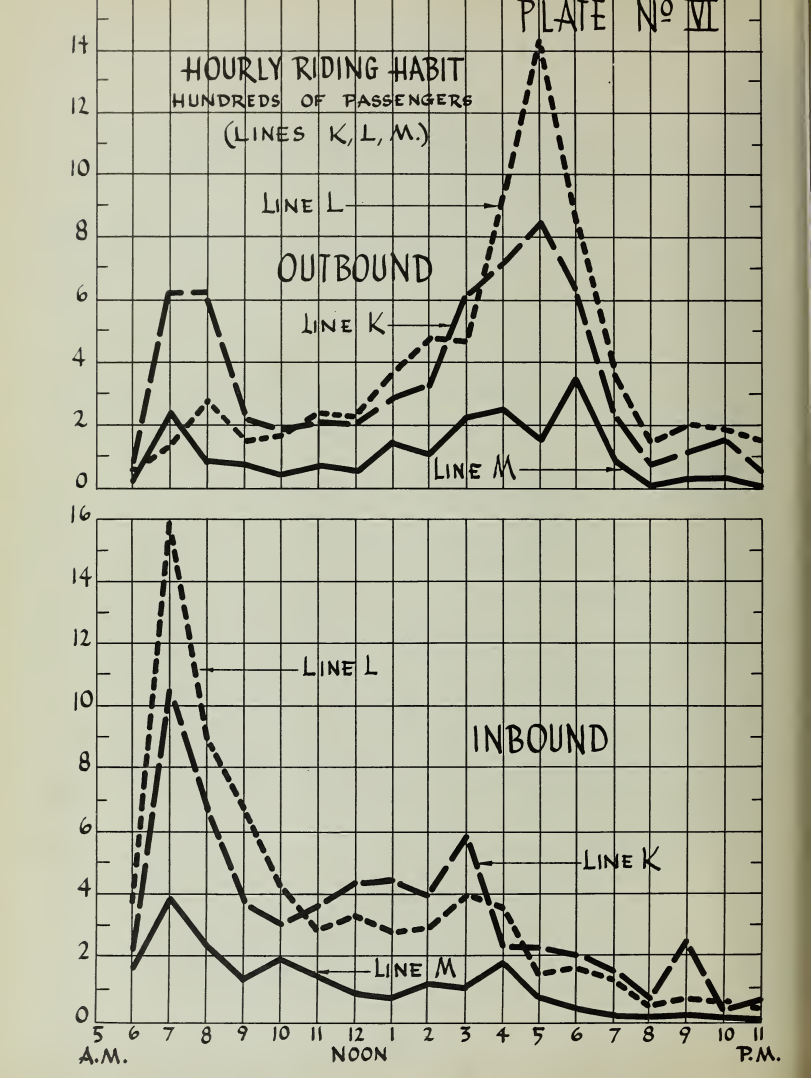


PLATE Nº VI
HOURLY RIDING HABIT
HUNDREDS OF PASSENGERS
(LINES K, L, M.)
LINE L
OUTBOUND
LINE K
LINE M
INBOUND
LINE L
LINE K
LINE M
0
2
4
6
8
10
12
14
16
5 6 7 8 9 10 11 12 1 2 3 4 5 6 7 8 9 10 11
A.M.
NOON
P.M.

branch of the No. 26 bus line operating direct from the city via Guerrero Street and San Jose Avenue to Broad Street and over Broad and Randolph and Worcester Streets to make a connection with the M line at 19th and Holloway Avenues.

TROLLEY COACH LINES

The success of trolley coach operation in San Francisco has been clearly proved both in public acceptance and in net earnings. In 1950 the trolley coach lines earned net income after depreciation of $504,583. All of the other transit mediums, street car, cable car and motor coach, lost money. Public interest dictates further expansion of the trolley coach net. It is, therefore, recommended that the following new trolley coach lines or extension of existing lines should be included in the next program for completion of rehabilitation of the Muny:-

B Geary

This will be a replacement of the Geary car line from Cabrillo and La Playa via Cabrillo, 45th, Balboa, 33d and Geary to Market Street. Inbound cars to the Bridge Terminal should turn south on Stockton and Fourth to Mission then via Mission to Main, to Market, to Geary. A short loop to turn part of the rush hour coaches should be from Geary via Kearny and Post to Market, thence to Geary. Operation of this trolley coach line will save $320,000 in annual operating expense.

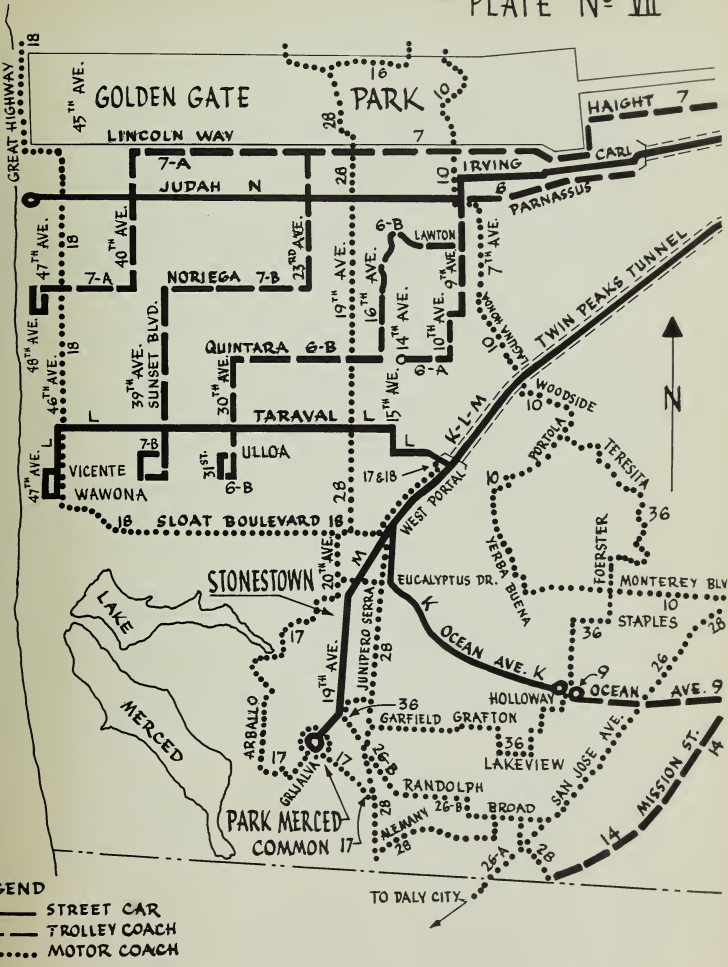
J Church

This will be replacement of the Church Street car line from Market Street via Church Street, 29th Street, Castro and 30th Streets to terminal at 30th and Church. Bridge Terminal coaches can use Mission Street from 4th to Main. Short turn coaches can turn back over the 4th-5th Street loop. This line will save $260,000 in annual operating expense as compared to street car and will replace that part of the No. 27 - Noe motor coach line west of Mission Street.

3 Jackson	This proposes a rerouting of the present Jackson line from terminal at California and Presidio via Presidio, Jackson, Fillmore, California, Leavenworth and Geary to the proposed Geary loop. This route will replace the O'Farrell-Jones cable and will give partial service on California from Leavenworth to Fillmore and continue the present service on Jackson west thereof.
6 Masonic	This proposes an extension of a branch of the Masonic trolley coach line from Lawton and 9th, via Lawton, Lomita, 16th, Quintara and 30th to Vicente thence looping via Vicente, 31st Avenue and Ulloa to terminal at 30th and Ulloa.
7 Haight	This proposes an extension of the Haight trolley coach line from present terminal at Haight and Stanyan via Stanyan, Frederick and Lincoln Way to 23d Avenue. From this point, one branch will further extend west on Lincoln Way to 40th thence south to Noriega and west to loop on 47th, Ortega and 48th Avenue to terminal at 47th and Noriega. The second branch will extend south on 23d to Noriega thence west to Sunset Boulevard and south thereon to Vicente thence looping via Vicente, 39th and Ulloa to terminal at Sunset Boulevard.

The above extensions of the Masonic and Haight trolley coach lines, as shown on Plate VII on Page 41, are intended to adequately cover the Sunset area - not already served by the Judah and Taraval car lines - and will replace the service now afforded in this area by the No. 20 Sunset Motor Coach line, the No. 78 - 30th Avenue shuttle and the No. 79 - Sunset Heights shuttle bus.

PLATE Nº VII



LEGEND

——— STREET CAR
— — TROLLEY COACH
..... MOTOR COACH

PROPOSED LOCAL STREET CAR, TROLLEY & MOTOR COACH LINES
IN
SUNSET, INGLESIDE & LAKE MERCED

8 Castro	This proposes an extension of the Castro trolley coach line from 19th via Castro to 26th thence looping via 26th, Diamond, Duncan and Newburg to terminal on Castro.
11 Hoffman	This proposes a replacement of the No. 11 - Hoffman motor coach line over Mission Street and 24th to terminal at 25th and Burnham.
25 Bryant-San Bruno	This proposes a replacement of the No. 25 motor coach line from a terminal at 5th and Mission via Mission, 6th, Howard, 11th, Bryant, Alameda, Potrero, Jerrold, Barneveld, Loomis, Channel and San Bruno to Third Street with possible extension via San Bruno, Bay Shore Boulevard and Geneva to terminal at Schwerin Street.
55 California	This proposes a replacement of the No. 55 - Sacramento motor coach from Drumm and California via California to Sixth Street. This line will parallel California Cable from Drumm to Hyde Street and will be used to provide rush hour service in and out of the financial district. Base, night and Sunday service on California will be via cable east of Hyde transferring to trolley west of Hyde.

MOTOR COACH OPERATION

Motor coach operation is the most economical method of serving lightly populated districts and in rendering express service or limited stop service from outer zones. The motor coach routes required in San Francisco should be improved through straightening and shortening some of the more complex lines and through the elimination of all worn out equipment now in service and replacement of this equipment with motor coaches of the same size and riding comfort as the trolley coaches.

AVAILABLE EQUIPMENT

The Muny now owns 493 motor coaches, including 259 purchased from the 1947 Bond Fund. At present writing, a total of 426 scheduled coaches are operated which leaves 67 spare coaches. After conversion of the No. 47 - Potrero and No. 14 - Mission lines to trolley coach (September), the motor coach schedule requirements will be reduced to 373. Necessary equipment spares will add 37 coaches or a total of 410. At that time the seventy old coaches, now unfit for passenger service, should be retired leaving 423 coaches available for service.

NEW MOTOR COACH PROGRAM

By 1952 the 259 motor coaches purchased in 1948 will be four years old and the remaining coaches will be older. This equipment is being depreciated on an eight year life and has an economical life of not more than ten years. A program for the annual purchase of forty modern fifty seat motor coaches of similar dimensions, riding qualities and comfort to the latest trolley coaches, should be instituted. Such a program will serve to keep the motor coach fleet up to a proper standard for passenger service and will afford just as much comfort to motor coach patrons as is now provided for trolley coach patrons.

EXPRESS OR LIMITED STOP SERVICE

A definite pattern of express or limited stop motor coach service should be made a part of most trolley or motor coach lines reaching the Pacific Ocean on the west or the county line on the south. Such service will afford to the patrons living farthest from the business distric reasonably fast transportation to and from their work. This special service should be inaugurated on the following lines:-

Route	Type of Base Service	Limited Stop	Express
1 California	Trolley		Yes
2 Clement	Motor	Yes	Yes
31 Balboa	Motor	Yes	Yes
5 McAllister	Trolley		Yes
7 Haight	Trolley	Yes	
16 Noriega (Exp)	Motor		Yes
14 Mission	Trolley	Yes	Yes
26 San Jose	Motor		Yes
25 Bryant-San Bruno	Trolley	Yes	
15 Third	Motor	Yes	Yes

IMPROVED MOTOR COACH COVERAGE

An improved routing of through motor coach lines in the general area south of Army Street to the county line should be developed. As an example, the Visitacion Valley could be better serviced by an extension of the No. 15 - Third Street motor coach line over Geneva to terminal at Mission rather than the partial extension of No. 15 line as at present. This would replace the present No. 50 - Geneva line as the extended No. 15 would serve either for passenger "shuttling" between Mission and Bay Shore or for through riding into the business district via Third Street. Improvement in motor coach service in the Lakeside District is also desirable. The great increase in population in the Parkmerced and Stonestown developments and the construction of the large commercial district at Stonestown make it desirable to route a motor coach line from Junipero Serra and Font Boulevard through the Parkmerced residential district to Lake Merced Boulevard and thence over the new connection through Stonestown to Eucalyptus Drive and over that drive to Junipero Serra and thence via St. Francis Circle to West Portal. Such a line through a splendid new residential district tying into three considerable business districts should be popular with shoppers. Similarly, the No. 18 - Sloat line should turn south from Sloat Boulevard on 20th Avenue to Eucalyptus Drive and thence via Eucalyptus, Junipero Serra and West Portal Avenue to terminal at West Portal. This should prove a popular shopping route for all people residing in the west Sunset District. All this is shown on Plate VII on Page 41. The No. 24 - Divisadero and No. 35 - Eureka lines should be joined to afford a crosstown connection from 3d and Army through the Mission and Hoffman Districts over Divisadero to Jackson. Similarly, the No. 10 - Monterey and No. 51 - Silver lines should be joined to afford a crosstown connection from the San Francisco Naval Shipyard to the Twin Peaks and Richmond Districts.

ADDITIONAL FACILITIES

A total of five new automatic substations will be required to replace old manually operated stations and to pick up the proposed trolley coach line load in the Sunset District. The present general repair shops at Elkton should be rebuilt to include a new paint shop and the Geneva car house requires reconstruction and alterations. An automatic block signal system should be installed in the Twin Peaks Tunnel capable of taking over control of the street car from the operator when the red

light is violated and new and improved type of fare box should be purchased to cope with the problems of future fares.

COST OF PROPOSED REHABILITATION — The capital cost of the program of conversion proposed herein to complete rehabilitation of the Municipal Railway is estimated as follows:-

A. UNIFIED CABLE SYSTEM			
1. Improvements at Mason Car House		$25,000	
2. Track & Cable changes required on California-Hyde line		52,000	
3. Special installation on Mason from Washington to California		4,200	
4. New car grips, etc.		2,000	
5. Rebuild California Cars		42,000	
6. Contingencies & Engineering		8,800	
		134,000	
Less possible sale of California car house		74,000	
		60,000	60,000
B. STREET RAILWAY SYSTEM			
1. Purchase 22 P.C.C. cars @ 35,000		770,000	
2. Rebuild 37 Old Cars @ 5,000		185,000	
3. Track rehabilitation - N Line		63,000	
4. Reroute M Line into Parkmerced		123,000	
5. Geneva Car House		100,000	
6. Automatic Block System - Twin Peaks Tunnel		255,000	1,496,000
C. PROPOSED TROLLEY COACH SYSTEM			
1. Trolley Overhead			
No. 3 Jackson rerouting		33,200	
No. 33 Ashbury-Bryant one-way rerouting		56,500	
No. 8 Castro extension		148,200	
No. 55 California (Sacramento) Conversion		589,300	
No. B Geary Conversion		343,100	
No. 25 Bryant-Potrero-San Bruno Conversion		580,000	
No. 11 Hoffman conversion		125,300	
No. J Church conversion		305,000	
No. 6 Masonic-Quintara extension		293,800	
No. 7 Haight-Lincoln-Noriega Ext.		286,000	
No. 7 Haight-Noriega-Sunset Ext.		263,000	
No. 30 Stockton-Townsend Ext.		30,000	3,053,400

D. PURCHASE 170 TROLLEY COACHES @ 20,000			$3,400,000
E. BUILD NEW TROLLEY COACH YARD			425,000
F. NEW SUBSTATIONS			1,060,000
G. NEW MOTOR COACHES			
1. Purchase of eighty 50 seat motor coaches covering two year replacement			1,600,000
H. CENTRAL SHOPS			
1. Rebuild General Shops	$400,000		
2. Construct new Paint Shop	100,000		
3. New roof on Automotive Shop	20,000		520,000
I. NEW FARE BOXES			250,000
TOTAL PROGRAM			11,864,400

GEARY ALTERNATIVE — Various alternatives are possible. For example, retention of Geary as a street car operation, in event of Charter change to permit one man operation, with new P.C.C. cars on all base runs and with rebuilt cars added to meet peak hour requirements, would reduce the total investment as follows:-

Eliminate	Trolley Overhead	343,000	
	57 Trolley Coaches	1,140,000	
	Trolley Coach Yard	425,000	1,908,000
Add	Purchase 22 P.C.C. Cars	770,000	
	Rebuild 13 old cars	65,000	
	Rebuild Geary Barn	200,000	1,035,000
Reduction			873,000

One man operation of the Geary car line would reduce annual expenses by $188,000 (based on 1950 costs) as against a possible $320,000 annual reduction through conversion to trolley coach.

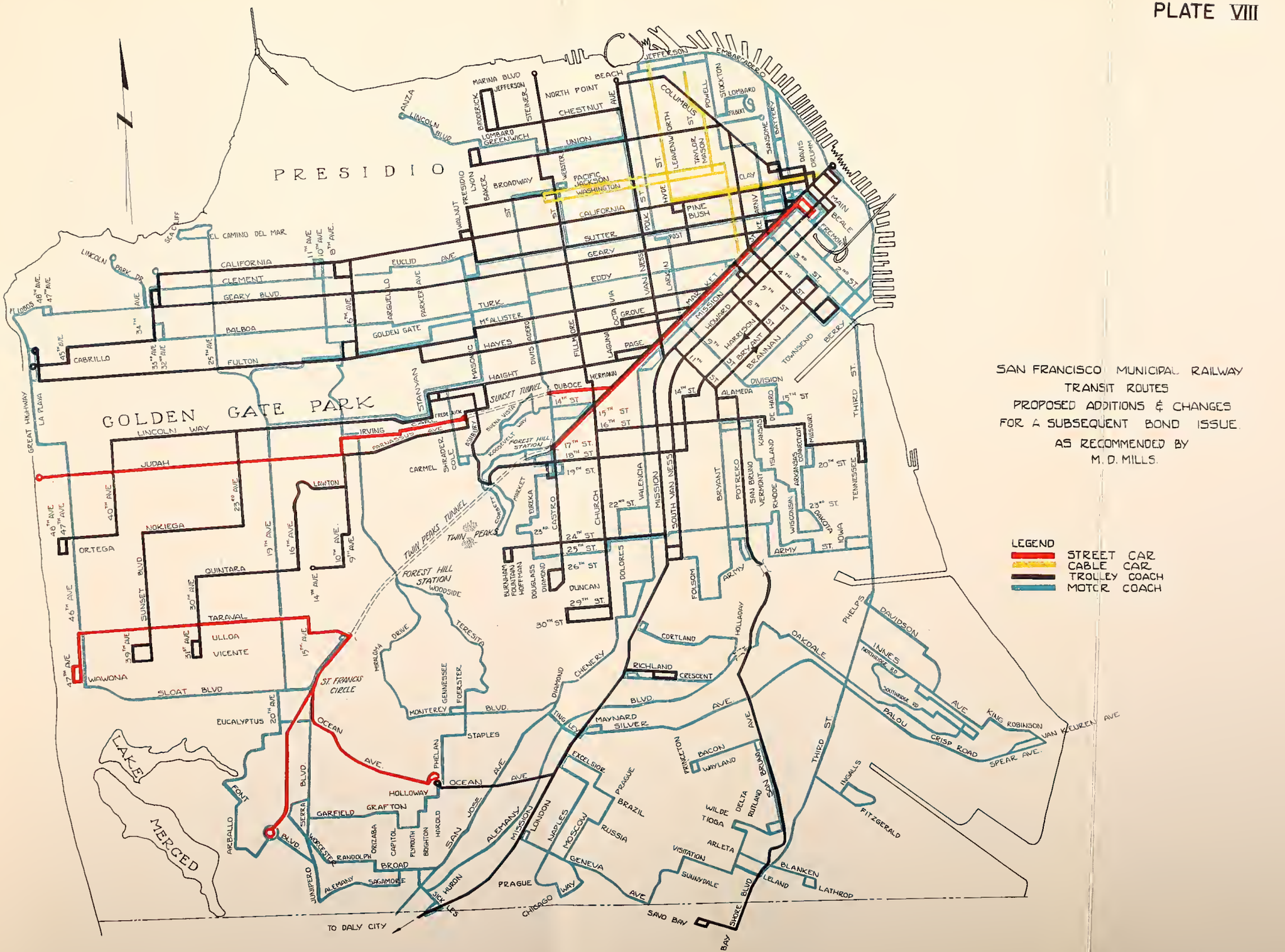
OTHER ALTERNATIVES

Another alternative would be the elimination of the proposed No. 6 - Masonic-Quintara and No. 7 - Haight-Lincoln-Noriega trolley coach lines in favor of all modern fifty seat motor coaches. This would reduce investment by some $875,000 and would afford equally good service. Still another alternative would be to replace the twenty-two old cars required in peak hour service on the K, L, M and N lines. This would add $660,000 to the capital cost and would serve to eliminate all old cars from service. The entire program is flexible so that other alternatives can be considered. However, it is submitted that the basic program which is proposed herein will adequately complete the modernization of the Municipal Railway and will provide service of uniform standard to all parts of the city.

MAP OF PROPOSED SYSTEM

There is presented on Plate VIII on Page 48, a map of the San Francisco Municipal Railway as it would appear if the foregoing program is adopted and put in effect.

PLATE VIII



SAN FRANCISCO MUNICIPAL RAILWAY
TRANSIT ROUTES
PROPOSED ADDITIONS & CHANGES
FOR A SUBSEQUENT BOND ISSUE.
AS RECOMMENDED BY
M. D. MILLS.

LEGEND
- STREET CAR
- CABLE CAR
- TROLLEY COACH
- MOTOR COACH

DL- 4459 EST.(445)

PART VII
CONCLUSIONS

REHABILITATION ACCOMPLISHED — This Report has attempted - in not too great detail - to picture the transit conditions existing in San Francisco at the end of the War and to tell of the modernization program which has been accomplished and which is in process of completion. This program has materially improved both traffic and transit in many parts of San Francisco and has served to provide a transit system which is much more economical in operation than the older system which it replaced and which compares favorably - in the service rendered to its patrons - with any other large transit property in the United States.

OPERATION — The loss of passengers to the competitive automobile during the period since the War which the Muny has experienced is parallel to what has happened to every urban transit system - likewise the greatly increased cost of operation as wages and materials continue to skyrocket upward.

ORGANIZATION — The changes that have been made within the organization to bring about better efficiency and control of operation have been effective. Definite improvement is noticeable and will continue.

PROGRAM FOR COMPLETION OF MODERNIZATION — A logical program for continued modernization has been proposed in Part VI which, when completed, will give San Francisco a complete up-to-date transit system capable of serving the city adequately for the forseeable future.

INCREASED REVENUE ESSENTIAL — While certain economies will result from the proposals contained in Part VI, the definite need for increased revenue under present economic conditions is indicated if all desired service is to be furnished to the people of San Francisco.

PART VIII
RECOMMENDATIONS

The following specific recommendations are made to the Public Utilities Commission to implement the proposals which are made in this Report:-

1. Develop a proposal for a bond issue to finance the conversion program specifically outlined in Part VI.

2. Propose legislation to bring about repeal of the initiative ordinance requiring two-man operation on street cars.

3. Determine the method by which increased revenue can be made available, through which improved and adequate service can be scheduled.

4. Acquire the California Street Cable Railway Company.

REVENUE, EXPENSE AND NET INCOME, MILEAGE, HOURS AND PASSENGERS CARRIED

CALENDAR YEAR 1947

Exhibit A-1

	STREET CARS		CABLE CARS		TROLLEY COACHES		MOTOR COACHES		SYSTEM	
REVENUE PASSENGERS	159,199,506		6,367,679		6,471,939		49,377,532		221,416,656	
MILEAGE	16,956,064		449,609		1,120,464		11,203,186		29,729,323	
REVENUE PASSENGERS PER MILE		9.4		14.2		5.8		4.4		7.4
		Cents Per Mile		Cents Per Mile		Cents Per Mile		Cents Per Mile		Cents Per Mile
REVENUE										
OPERATING REVENUE	$ 13,467,866	79.43	$ 542,462	120.65	$ 544,667	48.61	$ 4,178,844	37.30	$ 18,733,839	63.01
NON-OPERATING REVENUE	4,929	.03	-	-	-	-	-	-	4,929	.02
TOTAL REVENUE	$ 13,472,795	79.46	$ 542,462	120.65	$ 544,667	48.61	$ 4,178,844	37.30	$ 18,738,768	63.03
OPERATING EXPENSE										
Way and Structures	$ 878,995	5.18	$ 80,695	17.95	$ 13,096	1.17	$ 25,569	.23	$ 998,355	3.36
Equipment	1,025,115	6.05	45,002	10.01	43,415	3.88	795,229	7.10	1,908,761	6.42
Power	1,133,008	6.68	89,218	19.84	46,802	4.18	439,283	3.92	1,708,311	5.74
Transportation	7,276,635	42.91	307,096	68.30	242,908	21.68	2,545,040	22.72	10,371,679	34.89
General and Miscellaneous	1,419,335	8.37	45,484	10.12	56,740	5.06	552,891	4.94	2,074,450	6.98
Taxes	16,359	.10	-	-	-	-	-	-	16,359	.05
Provision for Accidents	1,337,115	7.89	54,013	12.01	54,139	4.83	414,790	3.70	1,860,057	6.26
TOTAL EXPENSE	$ 13,086,562	77.18	$ 621,508	138.23	$ 457,100	40.80	$ 4,772,802	42.61	$ 18,937,972	63.70
OPERATING NET	386,233	2.28	(79,046)	(17.58)	87,567	7.81	(593,958)	(5.31)	(199,204)	(.67)
DEDUCTIONS										
Provision for Depreciation	$								* $ 1,079,792	3.63
Interest Charges									110,295	.37
TOTAL DEDUCTIONS	$								$ 1,190,087	4.00
NET INCOME									$ (1,389,291)	(4.67)
REVENUE HOURS	1,923,863		85,364		120,845		1,081,517		3,211,589	
MILES PER HOUR		8.8		5.3		9.3		10.4		9.3

* Depreciation Not Funded

REVENUE, EXPENSE AND NET INCOME, MILEAGE, HOURS AND PASSENGERS CARRIED

Exhibit A-2

CALENDAR YEAR 1948

	STREET CARS		CABLE CARS		TROLLEY COACHES		MOTOR COACHES		SYSTEM	
REVENUE PASSENGERS	128,916,752		6,653,936		8,475,122		68,293,138		212,338,948	
MILEAGE	13,590,520		435,361		1,400,027		14,164,679		29,590,587	
REVENUE PASSENGERS PER MILE		9.5		15.3		6.1		4.8		7.2
		Cents Per Mile		Cents Per Mile		Cents Per Mile		Cents Per Mile		Cents Per Mile
REVENUE										
OPERATING REVENUE	$ 10,887,570	80.11	$ 567,310	130.31	$ 710,656	50.76	$ 5,765,357	40.70	$ 17,930,893	60.60
NON-OPERATING REVENUE	9,639	.07	-	-	-	-	-	-	9,639	.03
TOTAL REVENUE	$ 10,897,209	80.18	$ 567,310	130.31	$ 710,656	50.76	$ 5,765,357	40.70	$ 17,940,532	60.63
OPERATING EXPENSES										
Way and Structures	$ 698,223	5.14	$ 122,479	28.13	$ 13,572	.97	$ 29,580	.21	$ 863,854	2.92
Equipment	840,055	6.18	52,447	12.05	63,285	4.52	1,008,221	7.12	1,964,008	6.64
Power	996,424	7.33	112,329	25.80	61,377	4.38	906,738	6.40	2,076,868	7.02
Transportation	6,191,659	45.56	320,595	73.64	328,280	23.45	3,485,517	24.61	10,326,051	34.90
General and Miscellaneous	1,325,578	9.75	56,133	12.89	79,613	5.69	772,135	5.45	2,233,459	7.55
Taxes	18,832	.14	-	-	-	-	-	-	18,832	.06
Provision for Accidents	494,735	3.64	138,367	31.78	69,610	4.97	480,230	3.39	1,182,942	4.00
TOTAL EXPENSE	$ 10,565,506	77.74	$ 802,350	184.29	$ 615,737	43.98	$ 6,682,421	47.18	$ 18,666,014	63.09
OPERATING NET	331,703	2.44	(235,040)	(53.98)	94,919	6.78	(917,064)	(6.48)	(725,482)	(2.46)
DEDUCTIONS										
Provision for Depreciation	$								* $ 1,229,541	4.15
Interest Charges									85,056	.29
TOTAL DEDUCTIONS	$								$ 1,314,597	4.44
NET INCOME	$								$ (2,040,079)	(6.90)
REVENUE HOURS	1,537,698		82,018		148,884		1,436,998		3,205,598	
MILES PER HOUR		8.8		5.3		9.4		9.9		9.2

* Depreciation Not Funded

REVENUE, EXPENSE AND NET INCOME, MILEAGE, HOURS AND PASSENGERS CARRIED

CALENDAR YEAR 1949

Exhibit A-3

	STREET CARS		CABLE CARS		TROLLEY COACHES		MOTOR COACHES		SYSTEM	
REVENUE PASSENGERS	70,918,233		6,485,148		30,000,942		88,528,474		195,932,797	
MILEAGE	8,081,420		436,813		4,523,492		18,241,807		31,283,532	
REVENUE PASSENGERS PER MILE		8.8		14.8		6.6		4.9		6.3
		Cents Per Mile		Cents Per Mile		Cents Per Mile		Cents Per Mile		Cents Per Mile
REVENUE										
OPERATING REVENUE	$ 6,935,072	85.82	$ 636,949	145.82	$ 2,968,165	65.62	$ 8,719,057	47.80	$ 19,259,243	61.56
NON-OPERATING REVENUE	14,846	.18	-	-	-	-	-	-	14,846	.05
TOTAL REVENUE	$ 6,949,918	86.00	$ 636,949	145.82	$ 2,968,165	65.62	$ 8,719,057	47.80	$ 19,274,089	61.61
OPERATING EXPENSE										
Way and Structures	$ 461,909	5.72	$ 143,787	32.92	$ 67,031	1.48	$ 73,146	.40	$ 745,873	2.39
Equipment	615,619	7.62	54,273	12.43	207,712	4.59	1,287,061	7.06	2,164,665	6.92
Power	567,424	7.02	97,983	22.43	280,169	6.19	1,225,991	6.72	2,171,567	6.94
Transportation	3,945,741	48.82	337,845	77.34	1,256,345	27.78	4,581,708	25.12	10,121,639	32.35
General and Miscellaneous	892,082	11.04	68,515	15.68	299,257	6.62	1,077,800	5.91	2,337,654	7.47
Taxes	13,933	.17	-	-	-	-	-	-	13,933	.04
Provision for Accidents	511,578	6.33	47,206	10.81	219,504	4.85	644,254	3.53	1,422,542	4.55
TOTAL EXPENSE	$ 7,008,286	86.72	$ 749,609	171.61	$ 2,330,018	51.51	$ 8,889,960	48.74	$ 18,977,873	60.66
OPERATING NET	$ (58,368)	(.72)	$(112,660)	(25.79)	$ 638,147	14.11	$ (170,903)	(.94)	$ 296,216	.95
DEDUCTIONS										
Provision for Depreciation	$								* $ 1,631,881	5.22
Interest Charges									177,467	.57
TOTAL DEDUCTIONS	$								$ 1,809,348	5.79
NET INCOME	$								$ (1,513,132)	(4.84)
REVENUE HOURS	938,698		82,130		535,046		1,898,841		3,454,715	
MILES PER HOUR		8.6		5.3		8.5		9.6		9.1

* Depreciation Not Funded

REVENUE, EXPENSE AND NET INCOME, MILEAGE, HOURS AND PASSENGERS CARRIED

CALENDAR YEAR 1950

Exhibit A-4

	STREET CARS		CABLE CARS		TROLLEY COACHES		MOTOR COACHES		SYSTEM	
REVENUE PASSENGERS	45,213,292		5,552,762		46,728,376		85,925,280		183,419,710	
MILEAGE	5,250,665		398,238		6,667,908		17,604,402		29,921,213	
REVENUE PASSENGERS PER MILE		8.6		13.9		7.0		4.9		6.1
		Cents Per Mile		Cents Per Mile		Cents Per Mile		Cents Per Mile		Cents Per Mile
REVENUE										
OPERATING REVENUE	$ 4,461,771	84.98	$ 548,221	137.66	$ 4,610,267	69.14	$ 8,525,424	48.43	$ 18,145,683	60.65
NON-OPERATING REVENUE	3,140	.06	386	.10	3,210	.05	5,959	.03	12,695	.04
TOTAL REVENUE	$ 4,464,911	85.04	$ 548,607	137.76	$ 4,613,477	69.19	$ 8,531,383	48.46	$ 18,158,378	60.69
OPERATING EXPENSE										
Way and Structures	$ 351,870	6.70	$ 146,189	36.71	$ 91,533	1.37	$ 81,659	.46	$ 671,251	2.24
Equipment	466,265	8.88	57,729	14.50	280,314	4.20	1,140,564	6.48	1,944,872	6.50
Power	357,439	6.81	87,342	21.93	419,431	6.29	1,156,511	6.57	2,020,723	6.75
Transportation	2,684,662	51.13	317,451	79.71	1,878,474	28.17	4,537,251	25.77	9,417,838	31.48
General and Miscellaneous	676,358	12.88	80,656	20.25	514,450	7.72	1,251,492	7.11	2,522,956	8.43
Taxes	4,196	.08	-	-	-	-	-	-	4,196	.02
Provision for Accidents	331,993	6.32	40,683	10.22	342,125	5.13	632,672	3.59	1,347,473	4.50
TOTAL EXPENSE	$ 4,872,783	92.80	$ 730,050	183.32	$ 3,526,327	52.88	$ 8,800,149	49.98	$ 17,929,309	59.92
OPERATING NET	$ (407,872)	(7.76)	$(181,443)	(45.56)	$ 1,087,150	16.31	$ (268,766)	(1.52)	$ 229,069	.77
DEDUCTIONS										
Provision for Depreciation	$								* $ 1,771,924	5.92
Interest Charges									285,760	.96
TOTAL DEDUCTIONS	$								$ 2,057,684	6.88
NET INCOME	$								$ (1,828,615)	(6.11)
REVENUE HOURS	604,189		76,222		802,181		1,852,616		3,335,208	
MILES PER HOUR		8.7		5.2		8.3		9.5		9.0

* Depreciation Not Funded

4807